

Title (en)
PHOTOELECTROCHEMICAL CELL

Title (de)
PHOTOELEKTROCHEMISCHE ZELLE

Title (fr)
CELLULE PHOTOÉLECTROCHIMIQUE

Publication
EP 1768190 A4 20100505 (EN)

Application
EP 05739200 A 20050513

Priority
• JP 2005008767 W 20050513
• JP 2004162195 A 20040531

Abstract (en)
[origin: EP1768190A1] A photoelectrochemical cell (1) includes an electrolyte container (3) containing an ionic liquid (2), and a partitioning membrane (4) dividing an interior of the electrolyte container (3) into two being a CO₂ capturing chamber (7) and a CO₂ releasing chamber (8), having side walls opposing each other, with the partitioning membrane (4) in between, either as a carbon electrode (5) and the other as a photoelectrode (6). A redox mediator (B) has different bonding forces to carbon dioxide, as it appears as an oxidant B_{ox} and a reductant B_{red}, of which that one which has a greater bonding force serves as an intermediary chemical species carrying carbon dioxide to one of the paired electrodes (5, 6). Over the CO₂ releasing chamber (10), an upper wall portion (10) is formed, which has a CO₂ take-out port (10A) formed therein, for making use of oxidation and reduction of the redox mediator to achieve separation and concentration of carbon dioxide, converting photo energy of sunlight into electric power.

IPC 8 full level
H01G 9/20 (2006.01); **H01L 31/04** (2006.01); **B01D 53/32** (2006.01); **B01D 53/62** (2006.01); **B01D 53/86** (2006.01); **C25B 1/00** (2006.01); **H01M 14/00** (2006.01)

CPC (source: EP US)
B01D 53/326 (2013.01 - EP US); **B01D 53/62** (2013.01 - EP US); **B01D 53/864** (2013.01 - EP US); **C25B 1/55** (2021.01 - EP US); **H01G 9/2013** (2013.01 - EP US); **H01G 9/2018** (2013.01 - EP US); **H01M 14/005** (2013.01 - EP US); **B01D 2255/802** (2013.01 - EP US); **B01D 2257/504** (2013.01 - EP US); **Y02C 20/40** (2020.08 - EP US); **Y02E 10/542** (2013.01 - EP US); **Y02P 20/133** (2015.11 - EP US); **Y02P 20/151** (2015.11 - EP US)

Citation (search report)
• [I] NUSBAUMER H ET AL: "COII(DBBP)₂²⁺ COMPLEX RIVALS TRI-IODIDE/IODIDE REDOX MEDIATOR IN DYE-SENSITIZED PHOTOVOLTAIC CELLS", JOURNAL OF PHYSICAL CHEMISTRY. B, MATERIALS, SURFACES, INTERFACES AND BIOPHYSICAL, WASHINGTON, DC, US, vol. 105, no. 43, 1 November 2001 (2001-11-01), pages 10461 - 10464, XP008043902, ISSN: 1089-5647
• [I] PHILIAS J-M ET AL: "All-solid-state photoelectrochemical cell based on a polymer electrolyte containing a new transparent and highly electropositive redox couple", ELECTROCHIMICA ACTA, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, vol. 44, no. 17, 15 April 1999 (1999-04-15), pages 2915 - 2926, XP004161254, ISSN: 0013-4686
• See references of WO 2005117137A1

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